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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,944	10/31/2001	Sidney M. Bennett	KVC-051.01	5937

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EXAMINER

TURNER, SAMUEL A

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,944

Applicant(s)

BENNETT, SIDNEY M.

Examiner

Samuel A. Turner

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 45-56 is/are allowed.
- 6) ☒ Claim(s) 1,2,5-8,11-21,25-28 and 34-44 is/are rejected.
- 7) ☒ Claim(s) 3,4,9,10,22-24 and 29-33 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Office Action

The drawings are objected to because the drawings are informal. Correction is required.

Rejections Under 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 19 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Sakuma et al(JP407294264A).

Sakuma et al teach an all fiber Sagnac sensor gyroscope comprising a source(101), first coupler(105), polarizer(104), second coupler(106), modulators(108,108'), fiber coil(103), and detector(102). One modulator(108) is driven by a bias source(109) to bias the sensor while the modulator(108') can be used to provide a closed loop phase nulling configuration. This is all notoriously well known prior art. Sakuma however also places an optical amplifier(200) between the first coupler(105) and the detector(102).

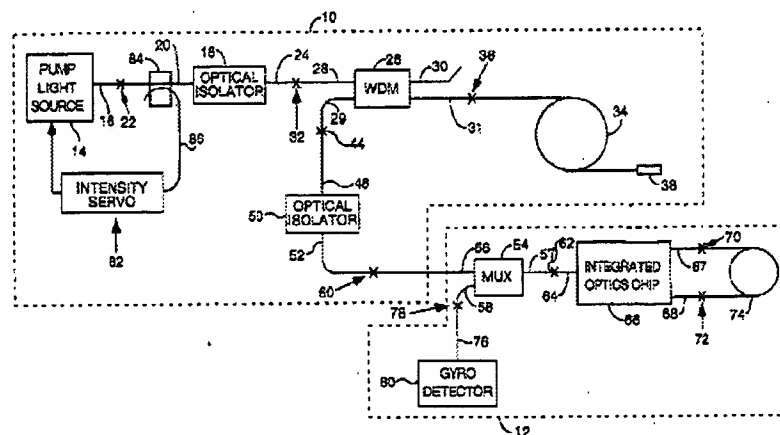
The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Claims 11-18, and 34-44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakuma et al(JP407294264A).

Official notice is taken that the optical amplifiers of claims 11, and 34-36; the optical elements of claims 16-18, and 42-44; and the Sagnac sensor configurations

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Sakuma et al with known equivalent optical amplifiers, known equivalent Sagnac sensor optical elements, or known equivalent sensor configurations as a mere matter of substitution of known equivalent sensor elements. For example substituting a known fiber coil with an integrated waveguide coil would have been a mere matter of the substitution of known equivalent sensor elements in order to reduce the sensor size.

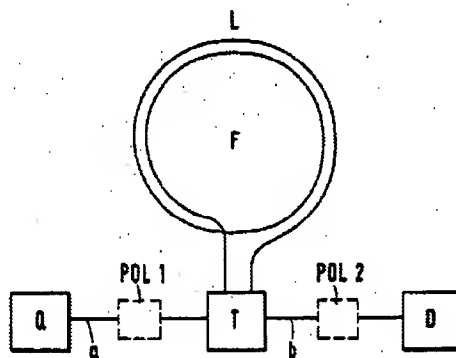
Rozelle et al teach a Sagnac sensor comprising a fiber pumped source(10), wavelength division multiplexer(54), integrated optics chip(66), fiber coil(74), and detector(80). optical isolators(18,50) are used to isolate the pump source from the fiber laser(34) while the isolator(50) isolates the fiber laser from the sensor output.



It would have been obvious to one of ordinary skill in the art at the time the invention was made to isolate various optical sources which would include and optical amplifiers from the output of previous optical elements. In the case of Sakuma it would have been obvious to position an isolator between the optical amplifier and the first coupler in order to isolate the sensor from the output from the optical amplifier which would then be seen as noise.

Claims 5 and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakuma et al(JP407294264A) as applied to claims 11-18, and 34-44 above, and further in view of Petermann et al(4,529,313).

This reference teaches placing a polarizer(POL2) at the detector(D) in order to pass only the desired polarization and thus further eliminating polarization crosstalk from the fiber coil and increasing accuracy.



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sakuma sensor by placing a polarizer at the detector in order to pass only the desired polarization and thus further eliminating

Claims 6, 7, 26, and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakuma et al(JP407294264A) as applied to claims 11-18, and 34-44 above, and further in view of Blake et al(5,469,257).

The diagram illustrates a control system for a laser, likely a He-Ne laser as mentioned in the text. The system includes a laser cavity (10) with mirrors (10', 10'') and an output mirror (10'''). Light from the laser is split by a beam splitter (17) into two paths. One path goes through a polarizer (15) and a photo-detector (12) to a phase detector (25). The other path goes through a phase adjuster (16') and a photo-detector (13). The output of the phase detector (25) is connected to a phase adjuster (26), which then feeds into a gain adjuster (29). The gain adjuster (29) is also connected to a bias modulation block (20). The output of the gain adjuster (29) is fed back to the laser cavity (10) via a beam splitter (19). Additionally, the output of the phase detector (25) is connected to a phase adjuster (27), which feeds into a phase detector (23). The output of the phase detector (23) is connected to a combiner (30), which then feeds into a filter (22). The output of the filter (22) is connected to an amplifier (21), which feeds back to the laser cavity (10) via a beam splitter (14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sakuma sensor by adding a polarizer(16') and a second detector(25) at the output of the first coupler to subtract out system noise.

Claims 8 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakuma et al(JP407294264A) and Blake et al(5,469,257) as applied to claims 6, 7, 11-18, 26, 27, and 34-44 above, and further in view of Rozelle et al(6,330,105).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to isolate various optical sources which would include and optical amplifiers from the output of previous optical elements. In the case of Sakuma it would have been obvious to position an isolator between the optical amplifier and the first coupler in order to isolate the sensor from the output from the optical amplifier which would then be seen as noise.

Reasons for Allowability

Claims 45-56 are allowed in view of the prior art of record.

Claim Objections

Claims 3, 4, 9, 10, 22-24, and 29-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to teach a coupler between the isolator and optical amplifier, a detector connected to the this coupler for receiving back emissions from the optical amplifier, and subtracting this detector signal from the

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sensor signal as claimed in the above allowed and objected to claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose telephone number is **(703) 308-4803**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font, can be reached on (703) 308-4881.

The fax phone number for this Group is (703) 308-7722. The faxing of papers related to this application must conform with the notice published in the Official Gazette, 1096 O.G. 30 (15 November 1989). The Group receptionist telephone number is (703) 308-0956.

Any inquiry of a technical nature regarding reissues, petitions, and terminal disclaimers should be directed to Ed Glick whose telephone number is (703) 308-4858, Hien Phan whose telephone number is (703) 308-7502, or Ed Westin whose telephone number is (703) 308-4823.

Any other inquiry of a technical nature, and all inquiries of a general nature including those relating to the status of this application or any patent term adjustment should be directed to TC2800 Customer Service Office whose telephone number is (703) 306-3329.



Samuel A. Turner
Primary Examiner
Art Unit 2877

SAT
June 30, 2003